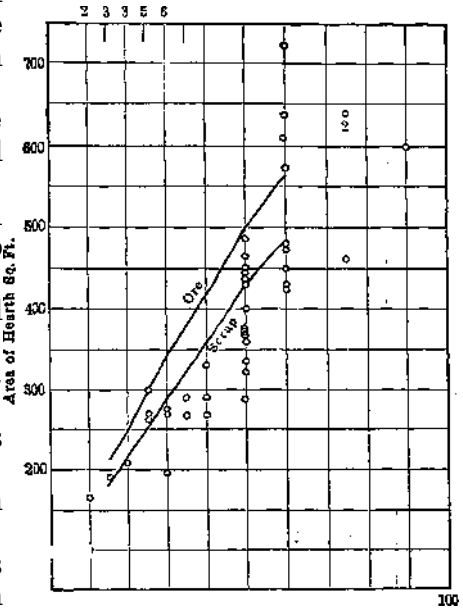
Number of Furances

The diagrams, Figs. 138,139,140 and 141 show, respectively, the approximate depth of bath in feet; the length of the hearth in feet; the width of the hearth in feet and the area of the hearth in square feet. Two lines have been plotted on these diagrams, showing the dimensions of the furnaces given in Table 4, which was abstracted from Professor Groume-Grjimailo's paper, in the *Journal de la Societe Russe de Metallurgie.* This table was given in *The Iron Age* of Dec. 26, 1917.



100 —s

Fig. 142 shows the profile of one side of the hearth sugges ted in this paper for a

10 20 30 50 60 70 80 90

ton furnace. These

FIG. 141.—Graphical Comparison of the Hearth

furnace hearths show a certain consistency in their design, a larger hearth and a shallower bath being suggested for the ore process than for the scrap process.

One feature of the open-hearth and similar furnaces that has

caused sorrow, and tribulation is that the bottom of the furnace forms a valley below the level of the port sills. One of the basic principles of furnace design is that the flame must lick the hearth or bottom of the furnace. The gas pressure in the heating chamber must be equal to the atmospheric pressure. This last means that a nice balance must be maintained between the volume of gas and air entering the chamber and the gases removed from the chamber. When the pressure in the furnace is permitted to drop below the atmospheric pressure cold air will tend to flow into the furnace around the doors and through all cracks and openings. This chills the bath and causes excessive oxidization to occur.